REMARKS

As allowed by 37 CFR §1.121(c), Applicants respectfully request that Claims **1**, **2**, **5 – 8**, **11**, **22** and **23** be amended; that Claims **4**, **10** and **24** be canceled; and that new Claims **25 – 27** be added as shown below.

CLAIM **1** IS AMENDED AS FOLLOWS:

In line 3 of the previously presented claim, a NEW clause is ADDED BEFORE original clause a) which reads --providing a first thermoplastic workpiece comprising a first surface, the first thermoplastic workpiece selected from the group consisting of polyimides, polyetherketones, polyetherimides, polyphenylenes, polyether-ether-ketones, and derivatives and substituents thereof;--. The clause is included in order to clarify the claim language. Support for "thermoplastic" is found in the written description at paragraph [00049]. Support for "the group consisting of ... and derivatives and substituents thereof" is found in paragraph [00049] and Claim **4** now canceled. Support for the remaining changes is found in lines 5 and 6 of the previously presented claim.

Again in line 3 of the previously presented claim, original clause "a)" is REIDENTIFIED as clause --b)--; the word "first" AFTER the words "creating a" is DELETED; and the words and punctuation "containing therein a first polymerizable material, wherein said first surface diffusion zone is adjacent to a first surface of a first workpiece and is within said first workpiece; and," are DELETED and REPLACED with the words and punctuation -- comprising a first polymerizable material within the first thermoplastic workpiece adjacent to the first surface;--. Again the clause is included in order to clarify the claim language. Support for "thermoplastic" is found in the written description at paragraph [00049]. Support for the remaining changes is found in lines 4 and 5 of the previously presented claim.

In line 7 of the previously presented claim, the previously UNIDENTIFIED clause BEGINNING with the words "removing any" is now IDENTIFIED as clause --c)--; and

the words "excess of said" are DELETED at the suggestion of the Examiner in order to remove a source of indefiniteness.

In line 8 of the previously presented claim, the word "said" AFTER the word "from" is DELETED and REPLACED with the words --and drying the--; and the word and comma "and," AFTER the semicolon are DELETED as superfluous. The change is made to better describe the embodiment. Support for the "drying" is found in the written description in paragraph [**00019**].

In lines 9 of the previously presented claim, a NEW clause is ADDED in place of original clause "b)" and now IDENTIFIED as NEW clause --d)--) which reads --d) providing a second thermoplastic workpiece comprising a second surface, the second thermoplastic workpiece selected from the group consisting of polyimides, polyetherketones, polyetherimides, polyphenylenes, polyether-ether-ketones, and derivatives and substituents thereof;--. The clause is included in order to clarify the claim language. Support for "thermoplastic" is found in the written description at paragraph [00049]. Support for "the group consisting of ... and derivatives and substituents thereof" is found in paragraph [00049] and Claim **4** now canceled. Support for the remaining changes is found in lines 5 and 6 of the previously presented claim.

Again in line 9 of the previously presented claim, original clause "b)" is REIDENTIFIED as clause --e)--; the word "second" AFTER the words "creating a" is DELETED; and the words "containing therein a second polymerizable material, wherein said second surface diffusion zone is adjacent to a second surface of a second workpiece and is within said second workpiece; and" are DELETED and REPLACED with the words and punctuation --comprising a second polymerizable material within the second thermoplastic workpiece and adjacent to the second surface;--. Again the clause is included in order to clarify the claim language. Support for "thermoplastic" is found in the written description at paragraph [00049]. Support for the remaining changes is found in lines 9 through 12 of the previously presented claim.

In line 13 of the previously presented claim, the previously UNIDENTIFIED clause BEGINNING with the words "removing any" is now IDENTIFIED as clause --f)--; and the words "excess of said" are DELETED at the suggestion of the Examiner in order to remove a source of indefiniteness.

In line 14 of the previously presented claim, the word "said" AFTER the word "from" is DELETED and REPLACED with the words --and drying the--; the comma and word ", and" AFTER the words "second surface" are DELETED as superfluous; and a carriage return and margin indentation is introduced BEFORE the words "wherein said first". The changes are made to better describe the embodiment. Support for the "drying" is found in the written description in paragraph **[00019]**.

In lines 17 of the previously presented claim, the word and comma "and," AFTER the semicolon are DELETED as superfluous.

In line 18 of the previously presented claim, original clause "c)" is REIDENTIFIED as clause --g)--; the FIRST use of the word "said" is DELETED and REPLACED with the word --the--; and the SECOND use of the word "said" is DELETED in order to improve the syntax of the sentence.

In line 19 of the previously presented claim, the word "surface" AFTER the word "bonding" is DELETED and REPLACED with the word --interface--. In order to improve the syntax of the sentence. Support for "interface" is found in the written description at paragraphs [00027] and [00038].

In line 20 of the previously presented claim, original clause "d)" is REIDENTIFIED as clause --h)--; the FIRST and SECOND uses of the word "said" are DELETED and REPLACED with the word --the-- in order to improve the syntax of the sentence.

In lines 21 and 22 of the previously presented claim, the FIRST use of the word "said" are DELETED and REPLACED with the word --the--; and the word "surface" AFTER the word "bonding" is DELETED and REPLACED with the word --interface--. In order to

improve the syntax of the sentence. Support for "interface" is found in the written description at paragraphs [00027] and [00038].

CLAIM **2** IS AMENDED AS FOLLOWS:

In line 1 of the previously presented claim, the word "A" BEFORE the word "method" is DELETED and REPLACED with the word --The--, and the words "joining as in" BEFORE the word and number "claim 1" are DELETED in order to correct the antecedence of the claim and to further clarify the claimed embodiment.

In line 2 of the previously presented claim, the words "one of said" BEFORE the words "first surface" are DELETED and REPLACED with the word --the--; and the word "said" BEFORE the words "second surface" is DELETED again in order to correct the antecedence of the claim and to further clarify the claimed embodiment.

In line 3 of the previously presented claim, the word --formed--; is ADDED AFTER the words "one microfeature" and BEFORE the word "therein". The change is made again further clarify the claimed embodiment. Support for "formed" is found in the inherency of the written description at paragraph [00030].

CLAIM **3** WAS CANCELED IN A PRIOR REPLY

CLAIM **4** IS NEWLY CANCELED

CLAIM **5** IS AMENDED AS FOLLOWS:

In line 1 of the previously presented claim, the dependency of the claim is changed from claim "**4**" to claim --**1**--; the word "A" BEFORE the word "method" is DELETED and REPLACED with the word --The--, and the words "joining as in" BEFORE the word and number "claim 4" are DELETED. The changes are made to account for the cancellation of claim **4** and to correct the antecedence language of the claim and thereby clarify the claimed embodiment.

In line 2 of the previously presented claim, the FIRST and SECOND uses of the word "said" are DELETED and REPLACED with the word --the-- in order to better describe the claimed embodiment.

In line 3 of the previously presented claim, the word "said" BEFORE the words "first polymerizable" is DELETED and REPLACED with the word --the-- in order to better describe the claimed embodiment.

CLAIM **6** IS AMENDED AS FOLLOWS:

In line 1 of the previously presented claim, the word "A" BEFORE the word "method" is DELETED and REPLACED with the word --The--, and the words "joining as in" BEFORE the word and number "claim 5" are DELETED in order to correct the antecedence of the claim and to further clarify the claimed embodiment.

In line 2 of the previously presented claim, the words "both of said" BEFORE the word "mixtures" are DELETED and REPLACED with the word --the-- again in order to further clarify the claimed embodiment.

CLAIM **7** IS AMENDED AS FOLLOWS:

In line 4 of the previously presented claim, the word "therein" BEFORE the words "polymerizable material" is DELETED; the words --within a first thermoplastic workpiece selected from the group consisting of polyimides, polyetherketones, polyetherimides, polyphenylenes, polyether-ether-ketones, and derivatives and substituents thereof-- are ADDED AFTER the word "material" and BEFORE the comma and the word "wherein"; and the word "said" BEFORE the words "first surface" is DELETED and REPLACED with the word --the--. Support for "thermoplastic" is found in the written description at paragraph [00049]. Support for "the group consisting of ... and derivatives and substituents thereof" is found in paragraph [00049] and Claim **4** now canceled.

In line 5 of the previously presented claim, the word "a" AFTER the words "first joining surface of" is DELETED and REPLACED with the word --the--. The change is made in order to maintain antecedence in the claim due to the earlier amendments.

In line 6 of the previously presented claim, the word --thermoplastic-- is ADDED AFTER the word "first" and BEFORE the word "workpiece". The change is made in order to maintain antecedence in the claim due to the earlier amendments.

In line 6 of the previously presented claim, the words "and is within said workpiece and" are DELETED as redundant and a carriage return and margin indentation are introduced BEFORE the words "removing any non-absorbed" in line 7.

of the previously presented claim,

In line 7 of the previously presented claim, a now previously UNIDENTIFIED clause BEGINNING with the words "removing any non-absorbed" is IDENTIFIED as NEW clause --b)--; and the words "excess of said", BEFORE the words "polymerizable material" in line 8 are DELETED at the suggestion of the Examiner in order to remove a source of indefiniteness.

In line 8 of the previously presented claim, the word "said" AFTER the word "from" is DELETED and REPLACED with the words --and drying the--; and the word and comma "and," AFTER the semicolon are DELETED as superfluous. The change is made to better describe the embodiment. Support for the "drying" is found in the written description in paragraph [**00019**].

In line 9 of the previously presented claim, original clause "b)" is REIDENTIFIED as clause --c)--; the word --thermoplastic-- is ADDED AFTER the word "second" and BEFORE the word "workpiece"; and the comma and words --, the second thermoplastic workpiece selected from the group consisting of polyimides, polyetherketones, polyetherimides, polyphenylenes, polyether-ether-ketones, and derivatives and substituents thereof-- are ADDED AFTER the words "second joining surface" and BEFORE the semicolon ending the clause. The change is made in order to maintain antecedence in the claim due to the earlier amendments and to better describe the embodiment. Support for "the group consisting of ... and derivatives and substituents thereof" is found in paragraph [00049] and Claim **4** now canceled.

In line 10 of the previously presented claim, the word "and", AFTER the semicolon ending the clause, is DELETED as superfluous.

In line 11 of the previously presented claim, original clause "c)" is REIDENTIFIED as clause --d)--; and the FIRST and SECOND uses of the word "said" are DELETED and REPLACED with the word --the-- in order to better describe the claimed embodiment.

In line 12 of the previously presented claim, the word "surface" BEFORE the word "bonding" is DELETED and REPLACED with the word --interface-- in order to better describe the claimed embodiment.

In lines 14 and 15 of the previously presented claim, original clause "d)" is REIDENTIFIED as clause --e)--; the word "said" BEFORE the word "polymerizable" is DELETED and REPLACED with the word --the--; the words "and join" are DELETED and superfluous; and the word "surface" BEFORE the word "bonding" is DELETED and REPLACED with the words --interface thereby joining the first and second thermoplastic workpieces-- in order to maintain antecedence and to better describe the claimed embodiment.

CLAIM **8** IS AMENDED AS FOLLOWS:

In line 1 of the previously presented claim, the word "A" BEFORE the word "method" is DELETED and REPLACED with the word --The--, and the words "joining as in" BEFORE the word and number "claim 7" are DELETED in order to correct the antecedence of the claim and to further clarify the claimed embodiment.

In line 2 of the previously presented claim, the words "one of said" BEFORE the words "first joining surface" are DELETED and REPLACED with the word --the-- again in order to further clarify the claimed embodiment.

In line 3 of the previously presented claim, the word "said" BEFORE the words "second joining surface" is DELETED and REPLACED with the word --the--; and the word --formed--; is ADDED AFTER the words "one microfeature" and BEFORE the word "therein". The change is made again further clarify the claimed embodiment.

Support for "formed" is found in the inherency of the written description at paragraph [00030].

CLAIM **9** WAS CANCELED IN A PRIOR REPLY

CLAIM **10** IS NEWLY CANCELED

CLAIM **11** IS AMENDED AS FOLLOWS:

In line 1 of the previously presented claim, the dependency of the claim is changed from claim "**10**" to claim --**7**--; the word "A" BEFORE the word "method" is DELETED and REPLACED with the word --The--, and the words "joining as in" BEFORE the word and number "claim 10" are DELETED. The changes are made to account for the cancellation of claim **10** and to correct the antecedence language of the claim and thereby clarify the claimed embodiment.

In line 2 of the previously presented claim, the word "said" BEFORE the words "first workpiece" is DELETED and REPLACED with the word --the-- again in order to further clarify the claimed embodiment.

In line 3 of the previously presented claim, the FIRST and SECOND use of the word "said" is DELETED and REPLACED with the word --wherein the-- again in order to further clarify the claimed embodiment.

CLAIMS **12 – 21** WERE CANCELED IN A PRIOR REPLY

CLAIM **22** IS AMENDED AS FOLLOWS:

In line 4 of the previously presented claim, the word "thererin" AFTER the word "containing" is DELETED; and in line 4 – 6 of the previously presented claim the words and punctuation "wherein said first surface diffusion zone is adjacent to a first surface of a first workpiece and is within said first workpiece; and," are DELETED and REPLACED with the words and punctuation --within and adjacent to a first surface of a first thermoplastic workpiece selected from the group consisting of polyimides, polyetherketones, polyetherimides, polyphenylenes, polyether-ether-ketones, and

derivatives and substituents thereof;--. The clause is included in order to clarify the claim language. Support for "thermoplastic" is found in the written description at paragraph [00049]. Support for "the group consisting of ... and derivatives and substituents thereof" is found in paragraph [00049] and Claim **10** now canceled. Support for the remaining changes is found in the previously presented claim.

In line 7 of the previously presented claim, the words "excess of said" are DELETED at the suggestion of the Examiner in order to remove a source of indefiniteness.

In line 8 of the previously presented claim, the word "said" AFTER the word "from" is DELETED and REPLACED with the words --and drying the--; and the word and comma "and," AFTER the semicolon are DELETED as superfluous. The change is made to better describe the embodiment. Support for the "drying" is found in the written description in paragraph **[00019]**.

In line 10 of the previously presented claim, the word "therein" AFTER the word "containing" is DELETED; and in line 10 – 12 of the previously presented claim the words and punctuation ", wherein said second surface diffusion zone is adjacent to a second surface of a second workpiece and is within said second workpiece; and," are DELETED and REPLACED with the words and punctuation --within and adjacent to a second surface of a second thermoplastic workpiece selected from the group consisting of polyimides, polyetherketones, polyetherimides, polyphenylenes, polyether-ether-ketones, and derivatives and substituents thereof;--. The clause is included in order to clarify the claim language. Support for "thermoplastic" is found in the written description at paragraph [00049]. Support for "the group consisting of ... and derivatives and substituents thereof" is found in paragraph [00049] and Claim **10** now canceled. Support for the remaining changes is found in the previously presented claim.

In line 13 of the previously presented claim, the words "excess of said" are DELETED at the suggestion of the Examiner in order to remove a source of indefiniteness.

In line 14 of the previously presented claim, the word "said" AFTER the word "from" is DELETED and REPLACED with the words --and drying the--; the comma and word ", and" AFTER the words "second surface" are DELETED as superfluous. The changes are made to better describe the embodiment. Support for the "drying" is found in the written description in paragraph [**00019**].

In line 15 of the previously presented claim, the FIRST and SECOND uses of the word "said" are DELETED and REPLACED with the word --the-- in order to better describe the claimed embodiment.

In line 18 of the previously presented claim, the word "said" BEFORE the word "first" and BEFORE the word "second" is DELETED and REPLACED with the word --the--; and the word "surface" AFTER the word "first" is DELETED. The change is made to better describe the embodiment.

In lines 19 and 20 of the previously presented claim, the words "surface has" are DELETED and REPLACED with the words --surfaces have--; and the word --formed-- is ADDED AFTER the words "microfluidic features" order to better describe the claimed embodiment. Support for "formed" is found in the inherency of the written description at paragraph [00030].

In line 20 of the previously presented claim, the word and comma "and," AFTER the semicolon are DELETED as superfluous.

In line 21 of the previously presented claim, the word "said" BEFORE the word "first" and BEFORE the word "second" is DELETED and REPLACED with the word --the--; and the word "surface" AFTER the word "second" is DELETED and REPLACED with the word --surfaces--. The change is made to better describe the embodiment.

In line 22 of the previously presented claim, the word "surface" AFTER the word "bonding" is DELETED and REPLACED with the word --interface-- order to better describe the claimed embodiment. Support for "interface" is found in the written description at paragraphs [00027] and [00038].

In line 24 of the previously presented claim, the FIRST and SECOND uses of the word "said" are DELETED and REPLACED with the word --the-- in order to better describe the claimed embodiment.

In line 25 of the previously presented claim, the word "said" AFTER the words "join across" is DELETED and REPLACED with the word –the-- in order to better describe the claimed embodiment.

In line 26 of the previously presented claim, the word "surface" AFTER the word "bonding" is DELETED and REPLACED with the word --interface-- in order to better describe the claimed embodiment. Support for "interface" is found in the written description at paragraphs [00027] and [00038].in order to better describe the claimed embodiment.

CLAIM **23** IS AMENDED AS FOLLOWS:

In line 4 of the previously presented claim, the word "therein" AFTER the word "containing" is DELETED; and in line 4 – 10 of the previously presented claim the words and punctuation "wherein said first surface diffusion zone is adjacent to a first surface of a first workpiece and is within said first workpiece; and," are DELETED and REPLACED with the words and punctuation --within and adjacent to a first joining surface of a first thermoplastic workpiece selected from the group consisting of polyimides, polyetherketones, polyetherimides, polyphenylenes, polyether-ether-ketones, and derivatives and substituents thereof;--. The clause is included in order to clarify the claim language. Support for "thermoplastic" is found in the written description at paragraph [00049]. Support for "the group consisting of … and derivatives and substituents thereof" is found in paragraph [00049] and Claim **10** now canceled. Support for the remaining changes is found in the previously presented claim.

In line 8 of the previously presented claim, the words "excess of said" are DELETED at the suggestion of the Examiner in order to remove a source of indefiniteness.

In line 9 of the previously presented claim, the word "said" AFTER the word "from" is DELETED and REPLACED with the words --and drying the--. The change is made to better describe the embodiment. Support for the "drying" is found in the written description in paragraph [**00019**].

In line 10 of the previously presented claim, the word and comma "and," AFTER the semicolon are DELETED as superfluous.

In line 11 of the previously presented claim, the word --thermoplastic-- is ADDED AFTER the words "providing a second"; and in line 12 of the previously presented claim, the punctuation and words --, the second thermoplastic workpiece selected from the group consisting of polyimides, polyetherketones, polyetherimides, polyphenylenes, polyether-ether-ketones, and derivatives and substituents thereof-- are ADDED AFTER the words "joining surface" and BEFORE the semicolon ending the clause. Further in line 12 the word and punctuation "and," are DELETED as superfluous. The changes are made to clarify the claim language. Support for "thermoplastic" is found in the written description at paragraph [00049]. Support for "the group consisting of ... and derivatives and substituents thereof" is found in paragraph [00049] and Claim **10** now canceled. Support for the remaining changes is found in the previously presented claim.

In line 13 of the previously presented claim, the word "said" BEFORE the word "first" is DELETED and REPLACED with the word --the--; and the words "joining surface" AFTER the word "first" are DELETED. The change is made to better describe the embodiment.

In line 14 of the previously presented claim, the word "said" AFTER the word "and" is DELETED; the words "surface has" are EDELETED and REPLACED with the words --surfaces comprise-- order to better describe the claimed embodiment.

In line 15 of the previously presented claim, the word --formed-- is ADDED AFTER the words "microfluidic features" in order to better describe the claimed embodiment; and the word and comma "and," AFTER the semicolon are DELETED as superfluous.

Support for "formed" is found in the inherency of the written description at paragraph [00030].

In lines 16 and 17 of the previously presented claim, the words "said first joining surface and said second joining surface" are DELETED and REPLACED with the words --the first and second joining surfaces--; and the word "surface" AFTER the word "bonding" is DELETED and REPLACED with the word --interface-- in order to better describe the claimed embodiment. Support for "interface" is found in the written description at paragraphs [00027] and [00038].in order to better describe the claimed embodiment.

In line 19 of the previously presented claim, the word "said" BEFORE the word "polymerizable" is DELETED and REPLACED with the word --the--. The change is made to better describe the embodiment.

In line 20 of the previously presented claim, the word "said" BEFORE the word "polymerizable" is DELETED and REPLACED with the word --the--; and the word the word "surface" AFTER the word "bonding" is DELETED and REPLACED with the word --interface-- in order to better describe the claimed embodiment. Support for "interface" is found in the written description at paragraphs [00027] and [00038].in order to better describe the claimed embodiment.

CLAIM **24** IS NEWLY CANCELED

CLAIMS **25 – 27** ARE NEWLY ADDED

Support for the newly ADDED Claims **25** and **26** is found in original Claims **5** and **6** and support for newly ADDED Claim **27** is found in original Claim **11**.

Applicants assert that no new matter has been introduced as a result of the foregoing amendments.

CLAIM REJECTION UNDER 35 U.S.C. §112

Examiner's Remarks

A. Examiner has rejected Claims **1, 2, 4 – 8, 10, 11** and **22 – 24** under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention in that:

> " *The limiting effect of "removing any non-absorbed excess of said [first/second] polymerizable material from said [first/second] surface" is unclear. It remains unclear to the examiner that the amended limitation limits the scope of the claim to the extent presented in the REMARKS filed 8/21/07. As discussed in the REMARKS, the claims are intended to be directed to a dry bonding polymerization welding technique where there are no adhesive materials on the surfaces of the workpieces.*
>
> *The examiner submits the term "excess" renders the scope of the claims indefinite because it is not clear whether all material that is non-absorbed is to be considered excess or whether there may be material on the surface of the substrate in accord with the acknowledged conventional methods. The examiner suggests the limitation be amended as follows: "removing any non-absorbed [first/second] polymerizable material from said [first/second] surface".*"

Applicants' Response

Applicants thank the Examiner for his review and suggestion regarding the prior amended claims. Applicants, therefore, have amended their claims accordingly to remove the grounds of indefiniteness raised by the Examiner. Consequently, Applicants respectfully request that the Examiner reconsider and withdraw his rejection under 35 U.S.C. 112, second paragraph.

CLAIM REJECTION UNDER 35 U.S.C. §102

Examiner's Remarks

A. Examiner has rejected Claims **1, 2, 7, 8, 22** and **23** under 35 U.S.C. 102(b) as being anticipated by Unger et al. (U.S. Patent Application Publication 2001/0054778) in that:

> " *Regarding claims 1, 2 and 22. Unger et al. teach a method of joining plastic comprising:*
>
> *a) creating a first surface diffusion zone containing therein a first polymerizable material. wherein said first surface diffusion zone is adjacent a first surface of a first workpiece; b) creating a second surface diffusion zone containing therein a second polymerizable material, wherein said second surface diffusion zone is adjacent to a second surface of a second workpiece, and wherein said first polymerizable material and said second polymerizable material are capable of bonding with each other; and, c) bringing said first surface and said second surface into intimate contact at a bonding surface; and d) causing said first polymerizable material and said second polymerizable material to react and join across said bonding surface (Abstract; paragraphs [0012, 0141, 0142, 0147, 0148]). Unger et al. teach at least one of said surfaces contains at least one microfeature (Title, paragraphs [0007,0010]).*
>
> *Regarding claims 7,8 and 23, Unger et al. teach a method of joining plastic comprising:*
>
> *creating a first surface diffusion zone containing therein a polymerizable material, wherein said first surface diffusion is adjacent to a first joining surface of a first workpiece; and, b) providing a second workpiece having a second joining surface; and, c) bringing said first joining surface and said second joining surface into intimate contact at a bonding surface; and, d) causing said polymerizable material to react and join across said bonding surface (paragraphs [0012, 0141, 0142, 0147, 0148]). Unger et al. teach at least one of said surfaces contains at least one microfeature (Title, paragraphs [0007, 0010]).*"

B. Examiner has rejected Claims **1, 2, 7, 8, 22-24** under 35 U.S.C. 102(b) as being anticipated by Soane et al. (U.S. Patent 6,176,962) in that:

> " *Regarding claims 1, 2, 22 and 24, Soane et al. teach a method of joining plastic comprising: a) creating a first surface diffusion zone containing therein a first polymerizable material, wherein said first surface diffusion zone is adjacent a first surface of a first workpiece; b) creating a second surface diffusion zone containing therein a second polymerizable material wherein said second surface diffusion zone is adjacent to a second*

surface of a second workpiece, and wherein said first polymerizable material and said second polymerizable material are capable of bonding with each other; and, c) bringing said first surface and said second surface into intimate contact at a bonding surface; and d) causing said first polymerizable material and said second polymerizable material to react and join across said bonding surface (Abstract; col. 3, lines 13-18and 47-50; col. 7, lines 20-28; col. 8, lines 11-18 and 25-27 and 35-39; col. 10, lines 4-26; col. 11, lines 57-col. 12, line 6; col. 13, lines 46-49; col. 14, lines 9-11). Soane et al. teach at least one of said surfaces contains at least one microfeature (Abstract). Specifically regarding the "drying" step of claim 24, Soane et al. also teach an evaporation step for evaporating solvent.

Regarding claims 7, 8 and 23, Soane et al. teach a method of joining plastic comprising: a) creating a first surface diffusion zone containing therein a polymerizable material, wherein said first surface diffusion is adjacent to a first joining surface of a first workpiece; and, b) providing a second workpiece having a second joining surface; and, c) bringing said first joining surface and said second joining surface into intimate contact at a bonding surface; and, d) causing said polymerizable material to react and join across said bonding surface (Abstract; col. 3, lines 13-18 and 47-50; col. 7, lines 20-28; col. 8, lines 11-18 and 25-27 and 35-39; col. 10, lines 4-26; col. 11, lines 57-col. 12, line 6; col. 13, lines 46-49; col. 14, lines 9-11). Soane et al. teach at least one of said surfaces contains at least one microfeature (Abstract)."

C. Examiner has rejected Claims **1, 4, 7, 10** and **24** under 35 U.S.C. 102(e) as being anticipated by Jing et al. (US 6,630,047) in that:

" *Regarding claims 1, 7 and 24, Jing et al. teach a method of bonding a fluoropolymer shaped article and a shaped substrate with non-adhesive materials (Abstract; col. 7, lines 67- col. 8, line 3) wherein a bonding composition which includes a polymerizable material and solvent, which is removed/dried (col. 3, lines 27-39 and col. 4, lines 12-25) is deposited on a surface and/or incorporated into the fluoropolymer and the substrate (col. 7, lines 46-67). The shaped articles/workpieces are brought together and bonded by radiation, heat and/or pressure (col. 8, lines 4-30).*

As to claims 4 and 10, Jing et al. teach various plastics may be employed, such as polyimides and polyketones (col. 5, lines 51-67)."

D. Examiner has rejected Claims **1, 2, 7, 8** and **24** under 35 U.S.C. 102(b) as being anticipated by Imbert et al. (US 2,822,575) in that:

" *Regarding claims 1, 7, and 24, Imbert et al. teach a method of bonding webs of fibrous materials/workpieces wherein thermosetting materials are applied to the fibrous webs to impregnate the webs (col. 3, lines 57-75; col. 4,*

lines 48-59). Excess material is removed/dried from the webs (col. 3, lines 72-75) and the webs are brought together and the thermosetting materials cross-link to from the bonded web (Figure 1). The examiner notes that resin intrinsically is within the webs in accord with the meaning of the term "impregnate".

As to claims 2 and 8, the pores of the fibrous webs/mats intrinsically form a "microfeature"."

Applicants' Response

Applicants thank the Examiner for his review of the prior amended claims. Applicants, however, respectfully disagree with the Examiner's conclusions.

A. Regarding Claims **1, 7, 22** and **23** Applicants note that they have amended their claim to further distinguish it over the cited art by now reciting a structure comprising a "*thermoplastic*" structure. Applicants, therefore, distinguish their claim over Unger et al. ('778) in that Unger et al. recite an elastomeric polymer structure comprising a polymer such as an RTV. Nowhere, however, does Unger et al. recite or disclose a thermoplastic polymer workpiece. Moreover, Unger, et al. ('778) do not teach drying the surfaces of their workpieces prior to bonding. Consequently, the Applicants respectfully traverse the Examiner's rejection of Claims **1, 7, 22** and **23** under 35 U.S.C. §102(b) because Unger et al. ('778) does not teach "... *each and every element as set forth in the claim* ..." as is be required by MPEP §2131 since the cited reference does not recite "a thermoplastic polymer structure..."

Therefore, Applicants respectfully assert that they have overcome the rejection of Claims **1, 7, 22** and **23** under 35 U.S.C. §102(b) because Unger et al. ('778) and respectfully request that the Examiner reconsider and withdraw his rejection of Claims **1, 7, 22** and **23** and pass these claim to allowance.

With regard to Claims **2** and **8** Applicants note all of the prior arguments used to rebut the argument of anticipation in Claims **1, 7, 22** and **23** apply equally to Claims **2** and **8** since each of these claims ultimately depends from Claim **1** and, therefore, merely narrows the scope of the base claim now shown to be not anticipated by Unger et al. ('778).

Therefore, Applicants assert that they have also overcome the rejection under 35 U.S.C. §102(b) with respect to Claims **2** and **8** in that they have remove the grounds for their rejection in that not all of the limitations of these claims can be found in the prior art. The Applicants, therefore, respectfully request that the Examiner reconsider and withdraw his rejection of Claims **2** and **8** and pass these claims to allowance.

B. Regarding Claims **1, 7, 22** and **23** Applicants note that they have amended their claim to further distinguish it over the cited art by now reciting a structure comprising a "*thermoplastic workpiece selected from the group consisting of polyimides, polyetherketones, polyetherimides, polyphenylenes, polyether-ether-ketones, and derivatives and substituents thereof*". Applicants, therefore, distinguish their claim over Soane et al. ('962) in that Soane recite suitable materials for their invention as being comprises of a "polymethylmethacrylate, polycarbonate, polyethylene terephthalate or polystyrene copolymers" structure which employ an adhesive layer or a curable elastomeric film to bond their structure. Nowhere, however, do Soane et al. recite or disclose preparing a polymer workpiece selected from the list consisting of "*polyimides, polyetherketones, polyetherimides, polyphenylenes, polyether-ether-ketones, and derivatives and substituents thereof*" nor do they teach to form a separate diffusion zone in their separate workpieces prior to a step of bring the workpieces together for assembly/joining but instead teach a "*...bonding material may be, for example, a fluid curable adhesive, or a fluid component reactive with the cover material **14** and/or with the base plate material **12**, a meltable adhesive film, or a cured elastomeric film ...*" (col. 6, lines 12 – 17) which may diffuse into the joined components after joining of these parts.

Consequently, the Applicants respectfully traverse the Examiner's rejection of Claims **1, 7, 22** and **23** under 35 U.S.C. §102(b) because Soane et al. ('962) does not teach "*... each and every element as set forth in the claim ...*" as is be required by MPEP §2131 since the cited reference does not recite "a thermoplastic workpiece selected from the list...".

Therefore, Applicants respectfully assert that they have overcome the rejection of Claims **1, 7, 22** and **23** under 35 U.S.C. §102(b) because Soane et al. ('962) and respectfully

request that the Examiner reconsider and withdraw his rejection of Claims **1**, **7**, **22** and **23** and pass these claim to allowance.

With regard to Claim **24** Applicants note that they have requested that this claims be canceled. Applicants therefore, assert that they have removed the grounds for the rejection of these claims and respectfully request that the Examiner reconsider and withdraw his rejection.

C. Regarding Claims **1** and **7** Applicants note that they have amended their claim to further distinguish it over the cited art by now reciting a structure comprising a "*thermoplastic workpiece selected from the group consisting of polyimides, polyetherketones, polyetherimides, polyphenylenes, polyether-ether-ketones, and derivatives and substituents thereof*". Applicants, therefore, distinguish their claim over Jing et al. ('047) in that Jing et al. recite an elastomeric polymer structure comprising at least one fluoropolymer layer such as a tetrafluoroethylene-perfluoropropyl vinyl ether copolymer (PFA), perfluoroelastomer, or mixtures thereof. Nowhere, however, does Jing et al. recite or disclose a structure comprising two or more workpieces that are both selected from the list consisting of "*polyimides, polyetherketones, polyetherimides, polyphenylenes, polyether-ether-ketones, and derivatives and substituents thereof*". Moreover, Jing et al. ('047) do not teach to form a separate diffusion zone in their polymer workpieces prior to a step of bring the workpieces together for assembly/joining, nor do they teach drying the surfaces of their workpieces prior to bonding.

Consequently, the Applicants respectfully traverse the Examiner's rejection of Claims **1** and **7** under 35 U.S.C. §102(b) because Jing et al. ('047) does not teach "... *each and every element as set forth in the claim* ..." as is be required by MPEP §2131 since the cited reference does not recite "a thermoplastic workpiece selected from the list..."

Therefore, Applicants respectfully assert that they have overcome the rejection of Claims **1** and **7** under 35 U.S.C. §102(b) because Jing et al. ('047) and respectfully request

that the Examiner reconsider and withdraw his rejection of Claims **1** and **7** and pass these claim to allowance.

With regard to Claims **4**, **10** and **24** Applicants note that they have requested that each of these claims be canceled. Applicants therefore, assert that they have removed the grounds for the rejection of these claims and respectfully request that the Examiner reconsider and withdraw his rejection.

D. Regarding Claims **1** and **7**, Applicants note that they have amended their claim to further distinguish it over the cited art by now reciting a structure comprising a "*thermoplastic*" structure. Applicants, therefore, distinguish their claim over Imbert et al. ('575) in that Imbert et al. recite an elastomeric polymer structure comprising a polymer such as an RTV. Nowhere, however, does Imbert et al. recite or disclose a thermoplastic polymer workpiece, nor do they teach drying the surfaces of their workpieces prior to bonding. Consequently, the Applicants respectfully traverse the Examiner's rejection of Claims **1** and **7** under 35 U.S.C. §102(b) because Imbert et al. ('575) does not teach "... *each and every element as set forth in the claim* ..." as is be required by MPEP §2131 since the cited reference does not recite "a thermoplastic polymer structure...".

Therefore, Applicants respectfully assert that they have overcome the rejection of Claims **1** and **7** under 35 U.S.C. §102(b) because Imbert et al. ('575) and respectfully request that the Examiner reconsider and withdraw his rejection of Claims **1** and **7** and pass these claim to allowance.

With regard to Claims **2** and **8** Applicants note all of the prior arguments used to rebut the argument of anticipation in Claims **1** and **7** apply equally to Claims **2** and **8** since each of these claims ultimately depends from Claim **1** and, therefore, merely narrows the scope of the base claim now shown to be not anticipated by Imbert et al. ('575).

Therefore, Applicants assert that they have also overcome the rejection under 35 U.S.C. §102(b) with respect to Claims **2** and **8** in that they have remove the grounds for their rejection in that not all of the limitations of these claims can be found in the prior art. The

Applicants, therefore, respectfully request that the Examiner reconsider and withdraw his rejection of Claims **2** and **8** and pass these claims to allowance.

Finally, with regard to Claim **24**, Applicants note that they have requested that this claim be canceled. Applicants therefore, assert that they have removed the grounds for the rejection of these claims and respectfully request that the Examiner reconsider and withdraw his rejection.

CLAIM REJECTION UNDER 35 U.S.C. §103

Examiner's Remarks

A.) Examiner has rejected Claims **4 – 6, 10, 11** under 35 U.S.C. §103(a), as being unpatentable over Soane, et al., (U.S. Patent 6,176,962) in view of Kawazoe et al. (U.S. Patent Application Publication 2005/0249637) and/or Stokich et al. (U.S. Patent 6,184,284) and/or White et al. (U.S. Patent 4,824,500) in that:

> " *Regarding claims 4-6, 10 and 11, Soane et al. teach the method as discussed in the 102(b) rejection above. Soane et al. do not explicitly elaborate as to all the combinations of conventional plastics and conventional polymerizable materials that may be employed. However, in analogous joining/bonding methods, Kawazoe et al, Stokich et al., and White et al. each taken individually or in combinations with each other teach and suggest the claim limitations.*
>
> *Therefore it would have been prima facie obvious to one having ordinary skill in the art at the time of the claimed invention to employ the conventional polymers and conventional polymerizable materials, as taught and suggested by Kawazoe et al., Stokich et al., and White et al., together with the method of Soane et al. for the purpose as taught by Kawazoe et al. of making a product suited for its purpose (paragraph [0034]), or as taught by White et al. for providing a binder which cures at low temperatures and has the required cure strength (col. 1, lines 46-51) or as taught by Stokich et al. to provide an adhesion promoter which reduces water absorption (col. 1, lines 38-59).*
>
> *Specifically, as to claims 4 and 10, Kawazoe et al., for example, show the known equivalence of PMMA, as specifically employed by Soane et al., with PEEK, PPS, and PEI (paragraphs [0030, 0034]), in similar microfluidic applications. As suggested by Kawazoe et al, the ordinarily skilled artisan would choose the material" depending on a purpose" (paragraph [0034]).*

As to claims 5 and 11, Stokich et al. (col. 1, lines 65- col. 2, lines 4; col. 2, lines 17-35 and 46-52; col. 14, lines 11-20; col. 15, lines 28-43) and White et al. (col. 5, lines 40-57; and col. 8, lines 8-14) for example, disclose that various polymers may be employed, and ,styrene and divinylbenzene, alone or together, may be employed as polymerizable materials.

As to claim 6, White et al., for example, employ styrene and divinylbenzene analogously in a ratio of 9:1 (col. 8, lines 6-14)."

B.) Examiner has rejected Claims **4 – 6, 10, 11** as being unpatentable over Unger, et al., (U.S. Patent Application Publication 2001/0054778) in view of Kawazoe et al. (U.S. Patent Application Publication 2005/0249637) and/or Stokich et al. (U.S. Patent 6,184,284) and/or White et al. (U.S. Patent 4,824,500) in that:

" *Regarding claims 4-6, 10 and 11, Unger et al. teach the method as discussed ithe102(b) rejection above. Unger et al. do not explicitly elaborate as to all the combinations of conventional plastics and conventional polymerizable materials that may be employed. However, in analogous joining/bonding methods, Kawazoe et al, Stokich et al., and White et at each taken individually or in combinations with each other teach and suggest the claim limitations.*

Therefore it would have been prima facie obvious to one having ordinary skill in the art at the time of the claimed invention to employ the conventional polymers and conventional polymerizable materials, as taught and suggested by Kawazoe et al, Stokich et al, and White et al. together with the method of Unger et al. for the purpose as taught by Kawazoe et al. of making a product suited for its purpose (paragraph [0034]), or as taught by White et al. for providing a binder which cures at low temperatures and has the required cure strength (col. 1, lines 46-51) or as taught by Stokich et al. to provide an ,adhesion promoter which reduces water absorption (col. 1, lines 38-59).

Specifically, as to claims 4 and 10, Kawazoe et al., for example, show the known equivalence of PMMA, as specifically employed by Kawazoe et al., with PEEK, PPS, and PEI (paragraphs [0030, 0034]), in similar microfluidic applications. As suggested by Kawazoe et al, the ordinarily skilled artisan would choose the material "depending on a purpose" (paragraph [0034)).

As to claims 5 and 11, Stokich et al. (col. 1" lines 65- col. 2, lines 4; col. 2, lines 17-35 and 46-52; col. 14, lines 11-20; col. 15, lines 28-43) and White et al. (col. 5, lines 40-57; and col. 8, lines 8-14) for example, disclose that various polymers may be employed, and styrene and divinylbenzene, alone or together, may be employed as polymerizable materials.

As to claim 6, White et al., for example, employ styrene and divinylbenzene analogously in a ratio approximately9:1 (col. 8, lines 6-14)."

C.) Examiner has rejected Claims **1, 2, 7, 8** and **22 – 24** as being unpatentable over Unger, et al., (U.S. Patent Application Publication 2001/0054778) in view of Gandhi et al. (U.S. Patent 6,123,798) in that:

> " *Regarding claims 1, 2, 22 and 24, Unger et al. teach a method of joining plastic comprising: a) creating a first surface diffusion zone containing therein a first polymerizable material, wherein said first surface diffusion zone is adjacent a first surface of a first workpiece; b) creating a second surface diffusion zone containing therein a second polymerizable material, wherein said second surface diffusion zone is adjacent to a second surface of a second workpiece, and wherein said first polymerizable material and said second polymerizable material are capable of bonding with each other; and c) bringing said first surface and said second surface into intimate contact at a bonding surface; and d) causing said first polymerizable material and said second polymerizable material to react and join across said bonding surface (Abstract; paragraphs[0012,0141, 0142, 0147, 0148]). Unger et al. teach at least one of said surfaces contains at least one microfeature (Title, paragraphs [0007, 0010])*
>
> *However, in an alternative interpretation of the "removing" limitation found in the claims, Unger et al. do not teach a step of removing/drying the polymerizable material from the surface of the workpieces such that there is no excess material. However, Gandhi et al. teach a method of bonding microfluidic devices where they teach that it is desirable to avoid the introduction of unwanted components into channels/chamber and that the bonding agents must be carefully applied (col.7, lines 2-14).*
>
> *Therefore it would have been prima facie obvious to one having ordinary skill in the art at the time of the claimed invention to have removed/dried material from the surface of the pieces employed by Unger et al., as suggested by Gandhi et al. for the purpose of ensuring the undesired introduction of unwanted components into channels/chambers is avoided.*
>
> *Regarding claims 7, 8 and 23, Unger et al. teach a method of joining plastic comprising: a) creating a first surface diffusion zone containing therein a polymerizable material, wherein said first surface diffusion is adjacent to a first joining surface of a first workpiece; and, b) providing a second workpiece having a second joining surface; and, c) bringing said first joining surface and said second joining surface into intimate contact at a bonding surface; and, d) causing said polymerizable material to react and join across said bonding surface (paragraphs [0012, 0141, 0142, 0147, 0148]). Unger et al. teach at least one of said surfaces contains at least one microfeature (Title, paragraphs[0007, 0010]).*

However, in an alternative interpretation of the "removing" limitation found in the claims, Unger et al. do not teach a step of removing/drying the polymerizable material from the surface of the workpieces such that there is no excess material. However, Gandhi et al. teach a method of bonding microfluidic devices where they teach that it is desirable to avoid the introduction of unwanted components into channels/chamber and that the bonding agents must be carefully applied (col. 7, lines 2-14).

Therefore it would have been prima facie obvious to one having ordinary skill in the art at the time of the claimed invention to have removed/dried material from the surface of the pieces employed by Unger et at, as suggested by Gandhi et al. for the purpose of ensuring the undesired introduction of unwanted components into channels/chambers is avoided."

D.) Examiner has rejected Claims **4 – 6, 10, 11** as being unpatentable over Unger, et al., (U.S. Patent Application Publication 2001/0054778) in view of Gandhi et al. (U.S. Patent 6,123,798), and further in view of Kawazoe et al. (U.S. Patent Application Publication 2005/0249637) and/or Stokich et al. (U.S. Patent 6,184,284) and/or White et al. (U.S. Patent 4,824,500) in that:

" *Regarding claims 4-6, 10 and 11, the combination teaches the method set forth above. Unger et al. do not explicitly elaborate as to all the combinations of conventional plastics and conventional polymerizable materials that may be employed. However, in analogous joining/bonding methods, Kawazoe et al, Stokich et al., and White et al. each taken individually or in combinations with each other teach and suggest the claim limitations.*

Therefore it would have been prima facie obvious to one having ordinary skill in the art at the time of the claimed invention to employ the conventional polymers and conventional polymerizable materials, as taught and suggested by Kawazoe et al, Stokich et al., and White et al. together with the method of Unger et al. for the purpose as taught by Kawazoe et al. of making a product suited for its purpose (paragraph [0034]), or as taught by White et al. for providing a binder which cures at low temperatures and has the required cure strength (col. 1, lines 46-51) or as taught by Stokich et al. to provide an adhesion promoter which reduces water absorption (col. 1, lines 38-59).

Specifically, as to claims 4.and 10, Kawazoe et al., for example, show the known equivalence of PMMA, as specifically employed by Kawazoe et al., with PEEK, PPS, and PEI (paragraphs [0030, 0034]), in similar microfluidic applications. As suggested by Kawazoe et al, the ordinarily skilled artisan would choose the material "depending on a purpose" (paragraph [0034]).

As to claims 5 and 11, Stokich et al. (col. 1, lines 65- col. 2, lines 4; col. 2, lines 17-35 and 46-52; col. 14, lines 11-20; col. 15, lines 28-43) and White et al. (col. 5, lines 40-57; and col. 8, lines 8-14) for example, disclose that various polymers may be employed, and styrene and divinylbenzene, alone or together, may be employed as polymerizable materials.

As to claim 6, White et al., for example, employ styrene and divinylbenzene analogously in a ratio approximately 9:1 (col. 8, lines 6-14)."

E.) Examiner has rejected Claims **2**, **8**, **22** and **23** as being unpatentable over Jing, et al., (U.S. Patent 6,630,047) in view of Gandhi et al. (U.S. Patent 6,123,798), in that:

" *As to claims 2, 8, 22 and 23, Jing et al. teach the method as set forth above. Jing et al. do not teach the shaped article has a microfeature or is a microfluidic device. However, Gandhi et al. teach a method of forming and bonding components chosen from a variety of plastics including PTFE and polyolefins to form a microfluidic device (col.4, line 59-col. 5, line3; col. 7, lines 5-15).*

Therefore it would have been prima facie obvious to one having ordinary skill in the art at the time of the claimed invention to have combined the teaching of Jing et al. and Gandhi et al. to have formed a bonded microfluidic device as suggested by Gandhi et al. while practicing the method of Jing et al. since Gandhi et al. teach that it is desirable to avoid the introduction of adhesives into the channels of the device during bonding and Jing et al. teach a bonding method that includes non-adhesive materials."

Applicants' Response

Applicants thank the Examiner for his review of the prior amended claims. Applicants, however, again respectfully disagree with the Examiner's conclusion.

A. Regarding Claims **4** and **10**, Applicants note that they have requested that these claims be canceled and have therefore removed the grounds for their rejection.

Applicants further note that with regard to remaining Claims **5**, **6** and **11** each of these claims is dependent on Claim **1** and, as Applicants have shown above, Soane et al. ('962) do not teach or disclose the same process as do the Applicants because Soane et al. do not teach to form a separate diffusion zone in one or more separate workpieces prior to a step of bring the workpieces together for assembly/joining. Rather, Soane et al. teaches a joining process which relies upon a "...*bonding material may be, for example, a fluid curable adhesive, or a*

*fluid component reactive with the cover material **14** and/or with the base plate material **12**, a meltable adhesive film, or a cured elastomeric film that provides physical or chemical characteristics to bind to the base plate in which at least one microchannel is formed.*" (col. 6, lines 12 – 17) some of which may diffuse into the joined components during joining of these parts. Moreover, Kawazoe et al. disclose the use of one or more pressure- or photo-sensitive adhesive layers applied to their workpiece (paragraphs [**0029**] and [**0036**]); Stokich et al. disclose a adhesive promoter comprising an "*...any alkoxysilane or mixture thereof capable of forming a solution with the cross linking prepolymer, oligomer, resin or mixtures thereof (herein referred to as polymer precursors) in an organic liquid.*"(col. 2, lines 61 – 64); and White, et al. discloses a method for repairing damage composite material articles by patch the damage area with one or more plies of a substrate material saturated with a curable resinous composition (col. 1, line 54 – 68). None of these references, therefore, teach or disclose one or more polymer workpiece having a separate diffusion zone in an opposite joining surface prior to a step of bring the workpieces together for the step of assembly/joining.

Consequently, the Applicants respectfully traverse the Examiner's rejection of Claims **4 – 6**, **10**, **11** under 35 U.S.C. §103(a), as being unpatentable over Soane, et al., (U.S. Patent 6,176,962) in view of Kawazoe et al. (U.S. Patent Application Publication 2005/0249637) and/or Stokich et al. (U.S. Patent 6,184,284) and/or White et al. (U.S. Patent 4,824,500) in that these references neither singly or in any combination teach "... *each and every element as set forth in the claim* ..." as shown in the foregoing arguments above and as is be required by MPEP §2143.

Therefore, Applicants respectfully assert that they have overcome the rejection of Claims **5**, **6** and **10** under 35 U.S.C. §103(a) and respectfully request that the Examiner reconsider and withdraw his rejection and pass these claims to allowance.

B. Regarding Claims **4** and **10**, Applicants note that they have requested that these claims be canceled and have therefore removed the grounds for their rejection.

Applicants further note that with regard to remaining Claims **5**, **6** and **11** each of these claims is dependent on Claim **1** and, as Applicants have shown above, Unger et al. ('778) do not teach or disclose the same process as do the Applicants because Unger et al. do not teach to form a separate diffusion zone in one or more separate workpieces prior to a step of bring the workpieces together for assembly/joining. Moreover, none of Kawazoe et al./Stokich et al./White, et al. teach or disclose polymer workpieces, at least one having a separate diffusion zone in a joining surface, prior to a step of bring the workpieces together for the step of assembly/joining. Furthermore, Unger, et al. disclose the use of elastomeric materials to provide their structure and to modify Unger, et al., through the suggested combinations with any of Kawazoe et al./Stokich et al./White et al. would destroy the utility of the Unger et al. structure since as disclosed in paragraph **[0186]** membrane **25** would not function if made of a "hard" thermoplastic polymer.

Consequently, the Applicants respectfully traverse the Examiner's rejection of Claims **5**, **6** and **11** under 35 U.S.C. §103(a), as being unpatentable over Unger, et al., (U.S. Patent 6,176,962) in view of Kawazoe et al. (U.S. Patent Application Publication 2005/0249637) and/or Stokich et al. (U.S. Patent 6,184,284) and/or White et al. (U.S. Patent 4,824,500) in that these references neither singly or in any combination teach "... *each and every element as set forth in the claim* ..." as shown in the foregoing arguments above and as is be required by MPEP §2143.

Alternatively, Applicants also respectfully traverse the Examiner's rejection of Claims **5**, **6** and **11** under 35 U.S.C. §103(a), as being unpatentable over Unger, et al., (U.S. Patent 6,176,962) in view of Kawazoe et al. (U.S. Patent Application Publication 2005/0249637) and/or Stokich et al. (U.S. Patent 6,184,284) and/or White et al. (U.S. Patent 4,824,500) in that the finding of *prima facie* obviousness is not sustainable because the proposed combination would render the primary reference unsatisfactory for its intended use if modified as suggested which is impermissible under MPEP §2143.01(V.).

Therefore, Applicants respectfully assert that they have overcome the rejection of Claims **5**, **6** and **11** under 35 U.S.C. §103(a) and respectfully request that the Examiner reconsider and withdraw his rejection and pass these claims to allowance.

C. Regarding Claim **24**, Applicants note that they have requested that this claim be canceled and have therefore removed the grounds for its rejection.

Applicants note that with regard to remaining Claims **1**, **2**, **7**, **8**, **22** and **23** as they have shown above, Unger et al. ('778) do not teach or disclose the same process as do the Applicants because Unger et al. do not teach to form a separate diffusion zone in one or more separate workpieces prior to a step of bring the workpieces together for assembly/joining. Moreover, Gandhi et al. (U.S. Patent 6,123,798) also do not teach or disclose forming a separate diffusion zone in opposite joining surfaces of one or more polymer workpieces and drying the surfaces prior to a step of bring the workpieces together for the step of assembly/joining. Instead, Gandhi et al. teach using known bonding techniques that "*...include, e.g., thermal bonding, ultrasonic bonding or welding, adhesive bonding, or solvent bonding*" and, preferably use a surface modification technique (texturing) coupled with thermal bonding to join their workpieces (col. 5, lines 31 – 33). Furthermore, as noted above, Unger, et al. disclose the use of elastomeric materials to provide their structure and to modify Unger, et al., through the suggested combinations with Gandhi et al. (U.S. Patent 6,123,798) would destroy the utility of the Unger et al. structure since as disclosed in paragraph [**0186**] membrane **25** would not function if made of a "hard" thermoplastic polymer.

Consequently, the Applicants respectfully traverse the Examiner's rejection of Claims **1**, **2**, **7**, **8**, **22** and **23** under 35 U.S.C. §103(a), as being unpatentable over Unger, et al. (U.S. Patent 6,176,962) in view of Kawazoe et al. (U.S. Patent Application Publication 2005/0249637) and/or Stokich et al. (U.S. Patent 6,184,284) and/or White et al. (U.S. Patent 4,824,500) in that these references neither singly or in any combination teach "... *each and every element as set forth in the claim* ..." as shown in the foregoing arguments above and as is be required by MPEP §2143.

Therefore, Applicants respectfully assert that they have overcome the rejection of Claims **1**, **2**, **7**, **8**, **22** and **23** under 35 U.S.C. §103(a) and respectfully request that the Examiner reconsider and withdraw his rejection and pass these claims to allowance.

D. Regarding Claims **4** and **10**, Applicants note that they have requested that these claims be canceled and have therefore removed the grounds for their rejection.

Applicants further note that with regard to remaining Claims **5**, **6** and **11** each of these claims is dependent on Claim **1** and, as Applicants have shown above, Unger et al. ('778) do not teach or disclose the same process as do the Applicants because Unger et al. do not teach to form a separate diffusion zone in one or more separate workpieces prior to a step of bring the workpieces together for assembly/joining. Moreover, as show, none of Gandhi et al./Kawazoe et al./Stokich et al./White, et al. teach or disclose polymer workpieces, at least one having a separate diffusion zone in a joining surface, prior to a step of bring the workpieces together for the step of assembly/joining. Furthermore, Unger, et al. disclose the use of elastomeric materials to provide their structure and to modify Unger, et al., through the suggested combinations with any of Kawazoe et al./Stokich et al./White et al. would destroy the utility of the Unger et al. structure since as disclosed in paragraph **[0186]** membrane **25** would not function if made of a "hard" thermoplastic polymer.

Consequently, the Applicants respectfully traverse the Examiner's rejection of Claims **5**, **6** and **11** under 35 U.S.C. §103(a), as being unpatentable over Unger, et al., (U.S. Patent 6,176,962) in view of Kawazoe et al. (U.S. Patent Application Publication 2005/0249637) and/or Stokich et al. (U.S. Patent 6,184,284) and/or White et al. (U.S. Patent 4,824,500) in that these references neither singly or in any combination teach "... *each and every element as set forth in the claim* ..." as shown in the foregoing arguments above and as is be required by MPEP §2143.

Alternatively, Applicants also respectfully traverse the Examiner's rejection of Claims **5**, **6** and **11** under 35 U.S.C. §103(a), as being unpatentable over Unger, et al., (U.S. Patent 6,176,962) in view of Gandhi et al. (U.S. Patent 6,123,798), Kawazoe et al. (U.S. Patent

Application Publication 2005/0249637) and/or Stokich et al. (U.S. Patent 6,184,284) and/or White et al. (U.S. Patent 4,824,500) in that the finding of *prima facie* obviousness is not sustainable because the proposed combination would render the primary reference unsatisfactory for its intended use if modified as suggested which is impermissible under MPEP §2143.01(V.).

Therefore, Applicants respectfully assert that they have overcome the rejection of Claims **5**, **6** and **11** under 35 U.S.C. §103(a) and respectfully request that the Examiner reconsider and withdraw his rejection and pass these claims to allowance.

E. Applicants note that with regard to Claims **2**, **8**, **22** and **23** as they have shown above, Jing et al. ('047) do not teach or disclose the same process as do the Applicants because Jing et al. ('047) do not teach to form a separate diffusion zone in their polymer workpieces prior to a step of bring the workpieces together for assembly/joining. Jing et al. instead teach the application of a light sensitive bonding composition comprising an electron donor to surfaces to be joined. Furthermore, Gandhi et al. (U.S. Patent 6,123,798) also do not teach or disclose forming a separate diffusion zone in opposite joining surfaces of one or more polymer workpieces prior to a step of bring the workpieces together for the step of assembly/joining.

Consequently, the Applicants respectfully traverse the Examiner's rejection of Claims **1**, **2**, **7**, **8**, **22** and **23** under 35 U.S.C. §103(a), as being unpatentable over Jing, et al. (U.S. Patent 6,176,962) in view of Gandhi et al. (U.S. Patent Application Publication 2005/0249637) in that these references neither singly or in any combination teach "... *each and every element as set forth in the claim* ..." as shown in the foregoing arguments above and as is be required by MPEP §2143.

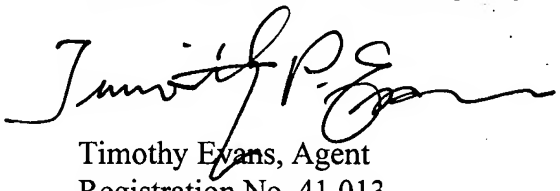
Therefore, Applicants respectfully assert that they have overcome the rejection of Claims **1**, **2**, **7**, **8**, **22** and **23** under 35 U.S.C. §103(a) and respectfully request that the Examiner reconsider and withdraw his rejection and pass these claims to allowance.

CONCLUSION

Applicants now believe that they have now addressed and cured the rejections set forth by the Examiner and, therefore, respectfully request entry of the amendments now presented and earnestly solicit allowance of this application.

This response is:

Respectfully submitted by,
SANDIA NATIONAL LABORATORIES



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